

Opmerkingen: Zie §2.2.1, blz. 17 t/m 19

Zie §2.3, blz. 22 t/m 23

Zie §2.6, blz. 32 en verder

Antwoorden:

$$\begin{aligned} \text{a. } \varepsilon^{(1)} &= 0,1 \text{ ‰} & \sigma^{(1)} &= 20 \text{ N/mm}^2 \\ \varepsilon^{(2)} &= 0,2 \text{ ‰} & \sigma^{(2)} &= 20 \text{ N/mm}^2 \\ \varepsilon^{(3)} &= 0,3 \text{ ‰} & \sigma^{(3)} &= 90 \text{ N/mm}^2 \end{aligned}$$

$$\begin{aligned} \text{b. } N^{(1)} &= +20 \text{ kN} \\ N^{(2)} &= +20 \text{ kN} \\ N^{(3)} &= +90 \text{ kN} \end{aligned}$$

$$\text{c. } F = 110 \text{ kN}$$

$$\text{d. } A_v = 20 \text{ kN } (\downarrow)$$

Toelichting:

$$\begin{aligned} \text{a. volkomen stijve ligger: } \Delta \ell^{(1)} &= \frac{2}{6} \times (0,6 \text{ mm}) = 0,2 \text{ mm} \\ \Delta \ell^{(2)} &= \frac{4}{6} \times (0,6 \text{ mm}) = 0,4 \text{ mm} \end{aligned}$$

$$\varepsilon^{(1)} = \frac{0,2 \text{ mm}}{2000 \text{ mm}} = 0,1 \times 10^{-3}; \text{ enz.}$$

$$\begin{aligned} \text{b. } N^{(1)} &= 0,1 \times 10^{-3} \times (200 \times 10^3 \text{ kN}) = +20 \text{ kN} \\ N^{(2)} &= 0,2 \times 10^{-3} \times (100 \times 10^3 \text{ kN}) = +20 \text{ kN} \\ N^{(3)} &= 0,3 \times 10^{-3} \times (300 \times 10^3 \text{ kN}) = +90 \text{ kN} \end{aligned}$$

$$\text{c. } \sum T_z \big|_A = 0 \Rightarrow F = 110 \text{ kN}$$

$$\text{d. } \sum F_{\text{vert}} = 0 \Rightarrow A_v = 20 \text{ kN } (\downarrow)$$